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ABSTRACT

A study of the Chemistry 110 and 131 courses at William Rainey Harper College (WRHC) was conducted to determine how students were using Chemistry 110 in their associate degree sequence and to investigate the recent enrollment declines in Chemistry 131. Records of students who enrolled in Chemistry 110 from fall 1979 to spring 1982 were examined to determine what other chemistry and science classes the students had taken, their major, and the percent who had earned an associate degree. Profiles of students who enrolled in Chemistry 131 were compared for 1975-76, 1981-82, and 1983-84. In addition, 110 chemistry departments in Illinois colleges were surveyed regarding their equivalent College Chemistry I (Chemistry 131) course. Information was solicited regarding teacher characteristics, attrition rates, teaching formats, average class size, enrollment patterns, trends in chemistry and chemical engineering majors, textbooks, and differences between day and evening sections. The profile of Chemistry 131 students indicated that the 1984-85 group differed significantly from previous years only in terms of a lower grade point average. Enrollments in Chemistry 110 jumped 65% from 1980-81 to 1981-82, but then leveled off. Of students who earned a grade in Chemistry 110, 51% took at least one more chemistry course, and 18.5% eventually earned an associate degree. Detailed survey findings and the questionnaire are included. (LAL)

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William Rainey Harper College

Study of Selected Chemistry Courses at Harper College

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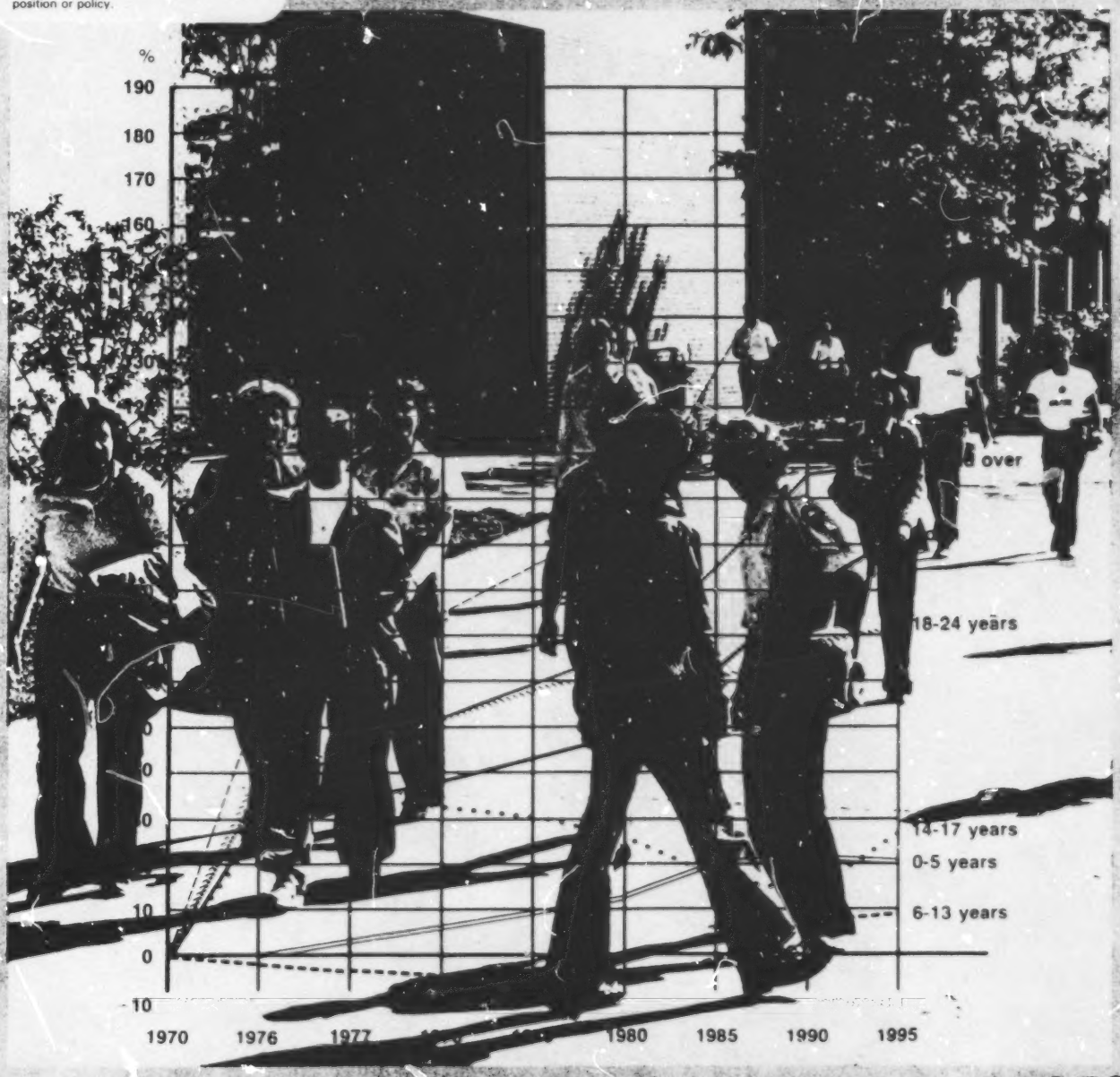

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A B S T R A C T

THE PURPOSE OF THIS STUDY WAS TO EVALUATE THE CHEMISTRY 110 AND 131 COURSES AT HARPER AS TO THEIR CURRENT RELEVANCE. CHEMISTRY FACULTY HAD SOME CONCERN AS TO HOW STUDENTS WERE NOW USING CHEMISTRY 110 IN THEIR ASSOCIATE DEGREE SEQUENCE. THERE WAS ALSO CONCERN ABOUT LOWER ENROLLMENTS IN CHEMISTRY 131 OVER THE YEARS.

IN ORDER TO ADDRESS THE CONCERN ABOUT CHEMISTRY 110, RECORDS OF STUDENTS ENROLLED IN THAT COURSE FROM FALL OF 1979 TO THE SPRING OF 1982 WERE EXAMINED. THE CONCERN ABOUT CHEMISTRY 131 WAS APPROACHED IN SEVERAL WAYS. FIRST, PROFILES OF STUDENTS ENROLLED IN THIS COURSE IN 1975-1976, 1981-1982, AND 1983-1984 WERE COMPARED. SECOND, A SURVEY (SEE APPENDIX) DEVELOPED JOINTLY BY THE CHEMISTRY FACULTY AND THE OFFICE OF PLANNING AND RESEARCH WAS MAILED TO 110 CHEMISTRY DEPARTMENTS OF COLLEGES IN ILLINOIS. AFTER A SECOND MAILING OF THE SURVEY TO NON-RESPONDENTS, 77 COLLEGES MAILED IN COMPLETED QUESTIONNAIRES WHILE SIX COLLEGES INDICATED THAT THEY DID NOT HAVE CHEMISTRY DEPARTMENTS. THE RESPONSE RATE AMONG COLLEGES WITH CHEMISTRY DEPARTMENTS WAS 74 PERCENT WHICH IS REMARKABLE.

RESULTS OF THIS ANALYSIS SHOWED THAT THE MAJOR TREND WHICH WAS IDENTIFIED WAS THAT CHEMISTRY 131 ENROLLMENT DROPPED SHARPLY IN THE FALL OF 1984 AS DID THE ABILITY LEVEL OF THE STUDENTS. THIS TREND WAS SO RECENT THAT IT COULD NOT BE NOTED IN THE SURVEY OF ILLINOIS COLLEGES CONDUCTED DURING THIS SAME TIME PERIOD. ABOUT SIXTY PERCENT OF THE ENROLLMENT IN THIS COURSE ARE ENGINEERING OR SCIENCE MAJORS. ONLY TEN PERCENT AT THE COMMUNITY COLLEGE LEVEL HAVE COMMITTED THEMSELVES SPECIFICALLY TO CHEMICAL ENGINEERING OR CHEMISTRY. THE SURVEY OF THE ILLINOIS COLLEGES SHOWED THERE WAS A SUBSTANTIAL DIFFERENCE BETWEEN FOUR-YEAR COLLEGES AND COMMUNITY COLLEGES IN THE TEXTBOOKS USED FOR THE CHEMISTRY 131-132 SEQUENCE.

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PURPOSE

The purpose of this study was to evaluate the Chemistry 110 and 131 courses at Harper as to their current relevance. Chemistry faculty had some concern as to how students were now using Chemistry 110 in their associate degree sequence. There was also concern about lower enrollments in Chemistry 131 over the years.

METHODOLOGY

In order to address the concern about Chemistry 110, records of students enrolled in that course from fall of 1979 to the spring of 1982 were examined. The focus here was to examine what other chemistry and science courses were taken by these students, the major of these students and the percent who earned an associate degree.

The concern about Chemistry 131 was approached in several ways. First, profiles of students enrolled in this course in 1975-1976, 1981-1982, and 1983-1984 were compared. Second, a survey (see appendix) developed jointly by the chemistry faculty and the Office of Planning and Research was mailed to 110 chemistry departments of colleges in Illinois. After a second mailing of the survey to non-respondents, 77 colleges mailed in completed questionnaires while six colleges indicated that they did not have chemistry departments. Therefore, the response rate among colleges with chemistry departments was 74 percent which is remarkable.

DISCUSSION OF RESULTS

Survey of Illinois Colleges with regard
to their teaching of Chemistry 131
or the equivalent

The sequence of Chemistry 131 and 132 are for the most part covered by two or three courses depending upon whether the college is on the semester or the quarter system. Credit hours for this sequence generally run from 8 to 10 semester hours.

These colleges report that on the average, enrollment is stable in these chemistry courses. As many colleges report an increase as report a decline in enrollment.

The median class size is 36 for lectures and 22 for labs. The average class size is 59 for lectures and 31 for labs. Eleven colleges report lecture sizes over 100 while five colleges report lab sizes of 50 or larger. Some 30 percent of the labs are taught by part-time faculty and 38 percent of the labs are taught in the evening. Illinois colleges report an attrition rate of 18 percent in the Chemistry 131 sequence.

These colleges report that 81 percent of classes are taught by traditional lecture method. Eight to 9 percent use the A/V approach while 5 percent use the lecture/computer approach. There appears to be a slight trend toward a decline in Chemistry and Chemical Engineering majors in Chemistry 131 courses.

The most frequently used textbook is Holtzclaw, Robinson, Nebergall, which is used exclusively by the community colleges. Community colleges also use the Brown-LeMay book frequently. Four-year colleges show strong preferences for the Mortimer and Masterton texts as well as the Brady-Humiston book.

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Analysis of Students Enrolled in Chemistry 131 at Harper Over the last ten years

The profile of the Chemistry 131 students shows that 10 percent are out-of-district but this has changed over the years. In the mid '70s, 15-17 percent were out-of-district but in the '80s, this percentage has fallen to 4-7 percent. The average number of chemistry courses is over two, meaning that students have taken at least one chemistry course besides 131. It is not known what these other community courses are because of the way the data was gathered. It is impossible to interpret the data from recent classes because they have not been here long enough to take additional courses in chemistry. Thus, their average number of chemistry courses taken is much lower.

The cumulative GPA of the Chemistry 131 student is 2.86 which is higher than the all-campus average of between 2.5 and 2.6. About 10 percent of the Chemistry 131 students have cumulative GPAs under 2.00. The average age of these students is 20.7 which is considerably under the all-campus average of 27.0. The majors of these students are divided among a number of fields. Engineering makes up 27 percent of the Chemistry 131 enrollees while 22 percent were science majors, 19 percent were in liberal arts, 7 percent were pre-professional, 6½ percent were chemistry majors, 5 percent majored in business, 4 percent were in chemical engineering and 4 percent were data processing majors.

The enrollment in Chemistry 131 averaged around 57 per year in the mid '70s, but climbed to about 70 in the early '80s. This year (1984-1985) enrollment dropped 30 percent to 48 students. When comparing the profile of the 1984-1985 Chemistry 131 students to past students, there is only one significant difference. Residence, age, and major field distribution is similar. Only the cumulative GPA is different. The GPA of this year's students is about .2 less than the average of past students.

Analysis of Students Enrolled in Chemistry 110 at Harper 1979-1982

Enrollments in this course jumped 65 percent from the 1980-1981 year (116) to the 1981-1982 year (192) but have leveled off since then. In examining the profile, one finds that 23 percent of those who earn a grade in this course go on to take Chemistry 121, while altogether, 51 percent of these students will take at least one more chemistry course. In addition, 18½ percent will eventually achieve an associate degree at Harper which is about the all-college average.

When one examines only those who do achieve an associate degree, it is found that 35 percent of these students take Chemistry 121. Moreover, 52 percent will enroll in at least one more chemistry course and will average almost 8 credit hours in the other sciences. The majors of these students are divided primarily between liberal arts (24%), science or math (23%), business (19%), engineering (14%), and a health care program (8%).

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Major Conclusions

The major trend which was identified was that Chemistry 131 enrollment dropped sharply in the fall of 1984 as did the ability level of the students. This trend was so recent that it could not be noted in the survey of Illinois colleges conducted during this same time period. About sixty percent of the enrollment in this course are engineering or science majors. Only ten percent at the community college level have committed themselves specifically to chemical engineering or chemistry. The survey of the Illinois colleges showed there was a substantial difference between four-year colleges and community colleges in the textbooks used for the Chemistry 131-132 sequence.

DETAILED RESULTS

Survey of Illinois College Chemistry Departments concerning the equivalent of Chemistry 131 and 132 Courses

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Make up of Lab Teaching Faculty

Primarily:	N	PCT
Lab Assistants	11.67	15.3
Full-Time Faculty	60.16	79.2
Part-Time Faculty	4.17	5.5
Total	76.	100.0

Percent of Sections Taught by Part-Time Faculty

Percent P/T	N
100	3
80	1
50	4
36	1
33	3
30	1
26	1
25	1
20	2
14	1
11	1
10	1
5	1
4	1
0	52
Total	74
Mean	12%
Median	0%

Percent of Sections Taught in Evening

Percent/Evening	N
67	1
50	2
40	2
33	5
27	1
25	5
23	1
22	1
20	4
10	5
5	1
0	46
Total	74
Mean	10%
Median	0%

Attrition Rates in These Courses

Attrition Rate	N
40%	3
25%	4
33%	1
30%	6
28%	2
25%	9
24%	1
23%	6
22%	1
20%	4
17%	3
16%	1
15%	6
14%	1
13%	1
12%	6
10%	4
9%	2
8%	3
6%	1
5%	8
4%	2
Total	75
Mean	19
Median	17

Format Used in Teaching the Class

Format	N	PCT
Traditional Lecture	76	80.9
Audio/Visual	8	8.5
Lecture/Computer	5	5.3
Lecture/Discussion/ Demonstration	3	3.2
Self Paced Learning	2	2.1
Total	94	100.0

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Survey of Illinois College Chemistry Departments
concerning the equivalent of Chemistry 131 and 132 Courses

Average Class Sizes

Lecture	
Size	N
300	3
225	1
200	2
195	1
150	2
120	2
72	1
65	2
60	1
56	1
55	1
50	3
48	1
46	1
45	4
40	9
38	2
36	2
32	4
30	8
28	1
26	1
25	4
24	1
23	3
20	7
18	3
15	2
10	1
9	1
Total	75
Average	59
Median	36

Lab	
Size	N
90	1
65	1
50	1
45	1
40	3
38	1
36	1
32	4
30	2
28	1
25	5
24	10
23	3
22	4
20	13
19	2
18	3
17	3
16	1
15	5
14	1
12	2
10	2
9	1
Total	71
Mean	24.5
Median	22

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Survey of Illinois College Chemistry Departments

Concerning the equivalent of Chemistry 131 and 132 Courses

Chemistry 131 and 132

Number of courses used to cover this material

Two	20	61%
Three	13	39%
	33	100%

Number of semester credit hours granted for the equivalency of these two courses

Semester Hours	N	PCT
12	1	2.8
11	2	5.5
10	14	38.9
9	2	5.5
8.5	1	2.8
8	12	33.3
7.5	1	2.8
7	1	2.8
6-2/3	1	2.8
6	1	2.8
	36	100.0

Three Courses Units - 11

Pattern of Enrollments in Last Ten Years

	N	PCT
Increased in enrollments	22	28.9
Stable enrollments	29	38.2
Fluctuates	2	2.7
Increased middle 70s stabilized then declined in 1984	1	1.3
Declined in enrollments	22	28.9
	76	100.0

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Trend in Number of Chemistry and Chemical Engineering Majors

Trend	N	PCT
Increased	8.5	18.5
Been Stable	22.5	48.9
Fluctuated	1	2.2
Declined	14	30.4
Total	46	100.0

Explanations for Increases or Decreases in Chemistry and Chemical Engineering Majors

Decline in economy - students cannot afford to "go away" to school. Many adults returning to school to "retrain" after losing jobs. Health profession (i.e. nursing) requires 101 for BS degree. Note - our 101-2 is the only freshman chemistry and is required of everyone who needs a year of college chemistry, not just chemistry and chemical engineers.

There are fewer competent chemistry teachers in high school. There are fewer disciplined students (i.e. people able to learn on their own outside the classroom).

Declire in total student body. Around 1973-75 we had about 13,000. Now about 10,000. Enrollments in our comparable courses were about 300 in fall, now about 230. But, for last 6-7 years has remained stable.

1974 enrollments increased until 1981 - maximum 1984, back to 1974 levels. Severe local economic condition, first people go to school finally leave area probably not related to chemistry at all.

Slight decline in overall enrollment, decline in number of pre-meds, etc., that we include in the course.

Overall promotional efforts help all areas.

University of Illinois does not reflect changes in students interest or population. There is always demand for more places than we have. Chemical Engineering had a big upswing recently but has leveled off. Most of the increased numbers had to take our service course anyway.

We had a constant "low" average of 8-10 students per year over last six years.

Current enrollment is about the same as last year. Decline may reflect the decreased number of high school students graduating from the high schools in our area.

Enrollment has leveled off in the last 3-4 years.

Job market, general economic condition, overall institutional enrollment decline.

Our chemistry courses have been accepted by U of I pharmacy school without reservation. In the past three years 100 percent of our students in the nursing program have passed their State boards on the first attempt (which, of course, included chemistry).

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Explanations for Increases or Decreases in
Chemistry and Chemical Engineering Majors (cont'd)

The ratios between pre-engineers and pre-health professionals may vary, but the total numbers are pretty constant. We rarely have more than 2 or 3 chemistry of chem-engineering majors.
Pre-meds and engineering peaks have been out of phase so that sum of two is essentially constant.
Ten years ago this department was still relatively new -- we have matured.
Based on last five years - no data available before that (answered with letter B)
Increase in school enrollment until this year - increase in school reputation.
Fluctuates about every third year, there is a big decline - not a definite reason.
Initially, but we do not hold them for all three courses (answered with Letter A)
We are working harder at getting Freshman into courses.
Several years ago Iranian students made up a substantial portion of the students in Chemistry and Physics. We no longer have these students. In addition, the American student enrollments have decreased. Med/Tech majors are way down also, our Engineering enrollment is down.
Increase due to expansion of pre-engineering program.
Fewer pre-med majors, biology majors, chemistry majors, fairly constant.
In general, but considerable variation from year to year.
Increased recruiting.
More students interested in engineering as an occupation, however, it appears that our enrollment has begun to stabilize and I look for a decline next fall.
Previously had some drop, but has returned to normal - Instructor change probably caused change.
It has been increasing each year. This is the best year in the past 10-20 experience a decrease about 6 percent.
Demographic and economic decline.
Students today are very practical. A chemistry major is quite demanding, and the final return for one's efforts (in terms of financial rewards) is less than one could get in another field, say accounting.
Courses enroll nurses, engineering students, medical technologists, chemistry and any major. In the 1970's enrollment was 75, in 1980's, 65.
First five years, it dropped slightly. Second five years, it rose slightly.
General decline in number of freshmen. Lack of emphasis on sciences in recruiting new students. Has been steady for last three years.
Truman College neighborhood has had a large influx of Asian immigrants (also middle Easterns, although this group is smaller). At least part of our growth is due to these and other foreign students.
Fewer students going into science and engineering.
Have experienced decline, but enrollments are now back at high for last ten years.
Total school enrollment has increased.
Our transfer number of students has increased.
Chemistry department started in fall 1980 (Richland Community College). Community college student population is declining in general in all areas of the college. Improved employment coupled with a decrease in high school graduates are the usual cited reasons.
This is the first year there has been an obvious blip (that being a dip) but we do not think that forecasts a real long trend.
The rapid growth of computer science as a major, progressively declining quality of high school chemistry instruction.
Fewer people considering science as a vocational goal - more undecided students who take "easier" sciences.
Our courses include Petrotech majors and there has been a decline in enrollment both of this major and of the school in general.
There is a tendency for students to seek those careers of highest possible financial reward. They perceive these to be in business, finance, marketing, and computers. Commitment in life, as required in medicine, teaching, etc., is lacking.
Increase in enrollments over last three years stable before then. More students interested in pre-med and sciences, biology.
Possibly, public attitude (negative) toward science, or at least ambivalence.
Very dry high school Chemistry courses.
General decrease in enrollment.
Increase in the number of pre-meds and engineers.
Students may not all be chemistry or engineering majors. New campus, enlarged district, economic decision.
Decline in enrollment schoolwide is determining the trend to some extent. I also feel that our recruiting policies are not conducive to attending strong science majors.
Baby boom, economic hard times, etc. Recruiting international students, etc., this year, slight decrease, fewer internationals, end of baby boom, better job market.
South suburban high school graduated largest classes about 3-5 years ago plus recession hit many industries here hard. Fear enrollment may begin to drop now quality of student body seems to have diminished.

Explanations for Increases or Decreases in
Chemistry and Chemical Engineering Majors (cont'd)

Strong employment and/or graduate employment possibilities known to students, good rapport between students and instructors.
Very simply, a chemistry major is seen as "too difficult", biology is more attractive to pre-medical students, because it is easier to get good grades.
We are working harder at getting students with such an interest and getting them into courses as freshmen.
Many are going into engineering, others into computer science. Some are turned off by chemistry's bad name with respect to the environment.
The quality has decline, we accept more students with a weaker background.
Variable - earlier decrease is now stabilizing, perceived job market, recruitment, and admissions activity.
Stable to slight increase - no reason known, things were quite bad about five years ago, getting better now.
Chemistry majors stable, chemical engineers have increased.
Recruiting practices of our school, lack of scholarships for strong science students.
Students seem not to be interested in putting in the necessary time.
Instituting our engineering program this year.
There are fewer competent high school chemistry teachers. We used to have 3-4 graduates per year go into teaching. A 1972 graduate was our last one to enter teaching. The education requirements are such that our chemistry majors would have to have a fifth year of education courses and practice teaching at one of the four state approved schools. They would then earn a salary two-thirds of that received by going directly to industry after four years of college. There are no benefits such as tuition reimbursements available to high school teachers. I see too many students taught by biology majors who found chemistry distasteful in college. More and more students think all learning occurs in the classroom and after-school hours are for outside jobs to earn money. They have not studied and learned on their own and therefore, have not experienced the satisfaction that comes with intellectual accomplishments.
A demanding program with better money to be made in other fields.
More serious attitude of young people in recent years, they see jobs in science fields especially chemistry as opposed to physics and biology.
Major started in 1981.
Job market a little better in chemical engineering.
Decline has been slight but seems to be attributable to a smaller entering group who express interest in chemistry.
Curriculum are too tough and students are too poorly prepared, especially in math.
Chemical engineering placement is down at the universities.

Textbooks Used	Community College	4-Year College	Total
Moltzclaw, Robinson, Nebergall-College Chemistry. . .	10	0	10
Mortimer.	2	6	8
Whitten and Gailey - Second Edition	3	4	7
Brown-Lemay, The Central Science.	5	2	7
Masterton, et all Fifth Edition	1	6	7
Ebbing, General Chemistry	3	3	6
Brady and Humiston - General Chemistry.	1	5	6
Petrucci, General Chemistry	1	4	5
Bailer, et al - Chemistry	2	2	4
Fundamentals of Chemistry - Brady and Holumn. . . .	1	3	4
Keenan, Kleinfelter, and Wood - Gen. College Chem. .	1	1	2
Redmore, Fundamentals of Chemistry.	2	0	2
McQuarrie and Rock - General Chemistry.	0	2	2
Bill Mahans, "University Chemistry"	0	1	1
Waser, Trudblook, Knobler, Chemistry One.	0	1	1
Henold and Walmsley starting this year, Brady and Humiston, first and second editions, previously . .	0	1	1
Mahon, and Ontoby and Nachtrieb (manuscript form - soon to be published)	0	1	1
Mahon, Dickerson - dropped because level dropped below students.	0	1	1
No response	1	0	1

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How do the Day and Evening Sessions Differ with Regard to Class Size, Student Type, Pace, etc.?

Generally in the past the evening sections are somewhat smaller and would probably have a somewhat older average age.
Class size, pace, the same evening students usually work during the day -- seem more determined to succeed.
Day - five section hours of 48 students. Night - two section hours of 24 students.
No evening sections.
This year only we have one evening and one Saturday class. The evening class has a better enrollment than Saturday. The pace is exactly the same, but the students tend to be the older ones usually with jobs in the afternoon so they take the 000 sections.
Most of the "real" students are in the day classes.
Evening classes are smaller, with more mature (usually employed) students, course content is identical.
No difference, Chem 106 and 107 are not normally taught at night (except in summer).
Class size 24 lecture, 24 lab, student type is about 6-7 years older, pace little faster than day school. It is 15 weeks long vs. 17 weeks, one final.
Chem 111 in winter quarter has some mix of students and pace as day classes. Full year sequence in summer covers material in ten weeks.
Days - most are recent high school graduates, 45 students. Evening - more older students, 20 students.
Have only one section.
Night - small classes, less fast paced, regular and town people, about equal at night but mostly regular students in daytime.
When offered, night sections are small, taught by part-time faculty and have a high attrition rate. Students come from all over, no general source.
Evening students are a little older and have greater motivation.
No difference. (2)
Class size smaller, students more mature and self motivated, pace is maintained at consistent level.
Same class size, same pace, but different structure, day - 4 class, 1-3 hour lab. Evening 3 hours class, second night: 1 hour class, 3-hour lab; students type: More people working heavier loads, including full time, more committed students, more older students.
Usually the same unless part-time instructor choose not to follow general syllabus. Evening student usually more intent on learning, but not always better prepared. Multi-hour evening lectures may make it hard for student to keep concentration.
Section usually full (28) pace is same. Students are more likely highly motivated working adults, but with less time to study. So pace balances out and pace equals same as day classes. A night section meets only twice a week. (1-2½ hour lecture and 1 lab) Students like the 2-day week.
Evening much smaller lecture about 48 students, type about same, often day students come in evening because course not offered in day (we do not schedule day and evening in same quarter). Pace - we try to keep it the same.
Same size, same pace, students are more mature (2)
Class size - same, evening, slightly lower, pace, similar (same course outlines)
Evening class size tends to be smaller, students are older.
Only one lecture section.
Chemistry is difficult. Students come unprepared with essential math skills. Day classes are preferred - students working do not have time to take class.
Evening sections have much smaller class size, generally older students and move at slower pace.
About same today. In past, p.m. students were older, more motivated. Our decline has been in p.m. students.
No difference, except students are older in the evening section.
No response (42)

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General Comments:

Our Chem 101 (or 103) and 102 includes all physical science, pre-engineering, and pre-health related professionals, not just chem majors.

We do not offer a separate general chemistry course for Chem/Chem Engineering majors.

Spring enrollments: (with 70% of those beginning in fall)

1974 - 70	1980 - 113
1975 - 72	1981 - 116
1976 - 83	1982 - 130
1977 - 79	1983 - 140
1978 - 95	1984 - 149
1979 - 85	

All Chemistry, Bio-Chemistry, Physics, Bio-Chemistry, and pre-Med majors take our general Chem (120). There is a non-major course (45 students) and a Nursing Chem (20 students).

The vast majority of the students taking our Chem 130-132 Chemistry classes are in some area of engineering; however, of the group, only a small number are in Chemical Engineering.

We do not break out Chemistry, Chem Eng., and Physical Science majors apart from pre-Med, pre-Dental, and so forth.

No response to survey, note on front page as follows:
We do not have courses comparable to these. Our only chemistry course does not require a previous course in high school.

Please note that the majority of students in these courses are not Chemistry majors. We graduate about 20 BS Chem majors a year.

1983-4 Fall, Spring, Summer - 38%
1984-5 Fall, 31%
These percents apply to all our Chemistry courses. All day CHM 101-102 are taught by full-time staff, all evening by part-time. So, for CHM 101-102, only part-time teach 20%.

We dropped our chemistry major two years ago while experiencing declining school enrollment and needing to "cut back" somewhere. The current students attending community colleges and small liberal arts 4-year colleges are simply not prepared to cope with mathematics. They move to other areas because they have never had to face adversity in their growing years and when difficulty comes, they simply move away from it or have someone in the family care for the problems. What has happened is a series of "lower level" chemistry classes for those who are not ready. Unfortunately, nobody wants to spare the time to get ready. I do not think anything can be done about the problem. Society has thrust upon itself a whole generation of "if at first you don't succeed - Quit" people. This will forever cost us in the future. Your course description is adequate. You (nor I) can do much to change the "thou cannot fail" syndrome that educators and psychologists have advocated for the last score of years. After all, welfare isn't really such a bad idea for getting by!
Note: Although this facility has dropped its Chem major answers to survey were included in the complete tallying of surveys.

We do not teach general chemistry for Chem Engineering majors since that course is lower division. We are upper division only (junior/senior/masters), therefore, I can only give you guesses at what would be the case.

COMPARISON OF HARPER COLLEGE CHEMISTRY 131 SECTIONS

1975 TO 1984

Enrollment History / Student Residency	Sections: Fall '75 Spring '76	Fall '76 Spring '77	Fall '81 Spring '82	Fall '83 Spring '84	Fall '84 Spring '85	Total
Number Enrolled	55	58	72	69	48	302
Percentages						
In-District	85.5	82.8	93.1	92.8	95.8	90.1
Out-of-District	14.5	17.2	6.9	7.2	4.2	9.9
Number of Chemistry Courses in Which Students Earned a Grade						
1	23.6	36.2	13.9	40.6	79.2	36.4
2	56.4	43.1	38.9	44.9	20.8	41.4
3	3.6	6.9	18.1	8.7	0	9.3
4	12.8	8.6	18.0	2.9	0	9.0
5	3.6	5.2	9.7	2.9	0	4.6
6	0	0	1.4	0	0	.3
Average	2.16	2.03	2.75	1.83	1.21	2.05
CUM GPA	2.95	2.83	2.88	2.87	2.67	2.86
Pct. under 2.00	1.8	14.3	8.3	11.8	19.4	10.5
Age Distribution						
15	0	0	1.4	0	2.2	.7
17	5.7	1.9	11.1	10.3	8.7	7.9
18	49.0	37.7	37.5	44.1	39.1	41.4
19	18.9	26.4	19.4	23.5	19.6	21.6
20	3.8	3.8	8.3	8.8	4.3	6.1
21	0	9.4	1.4	1.5	8.7	3.8
22	3.7	1.9	1.4	1.5	2.2	2.1
23	5.7	1.9	5.5	1.5	0	3.1
24	3.8	5.6	5.6	0	0	3.1
25	7.5	1.9	4.2	0	0	2.7
26	1.9	1.9	0	2.9	4.3	2.1
27	0	3.8	0	2.9	2.2	1.7
28	0	0	1.4	1.5	0	.7
29	0	1.9	0	0	2.2	.7
30	0	1.9	1.4	1.5	4.3	1.7
37	0	0	1.4	0	0	.3
39	0	0	0	0	2.2	.3
Average	20.0	20.7	20.3	19.8	20.7	20.3
Major Area of Study Distribution						
Engineering	27.3	20.7	34.7	23.2	29.2	27.1
Math & Science	27.3	19.0	20.8	21.7	18.7	21.8
Liberal Arts	12.7	25.9	18.0	14.5	27.1	19.2
Pre-Professional	9.1	10.3	2.8	7.2	6.2	6.9
Chemistry	1.8	5.2	6.9	8.7	10.4	6.6
Business	5.5	8.6	4.2	5.8	0	5.0
Chemical Engineering	5.5	5.2	0	5.8	4.2	4.0
Data Processing	1.8	3.4	2.8	8.7	2.1	4.0
Health Career Programs	1.8	0	4.2	1.5	0	1.7
Electronics	0	0	1.4	1.4	2.1	1.0
Journalism	3.6	0	0	0	0	.7
Education	0	0	1.4	1.5	0	.7
Mechanical Engineering Technology	0	1.7	1.4	0	0	.7
Child Development	1.8	0	0	0	0	.3
Secretarial	1.8	0	0	0	0	.3
Music	0	0	1.4	0	0	.3

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ANALYSIS OF

HARPER COLLEGE CHEMISTRY 110 STUDENTS FALL 1979 TO SPRING 1982

Enrollment History	Fall 1979	Spring 1980	Fall 1980	Spring 1981	Fall 1981	Spring 1982	Total
Number Enrolled	43	73	109	83	90	97	495
Percent who went on to take Chem 121	30.2	21.9	20.2	21.7	25.6	21.6	22.8
Percent who never took another Chem course	39.5	50.7	56.9	47.0	42.2	49.5	48.7
Percent who achieved an Associate Degree	20.9	17.8	13.8	20.5	20.0	19.6	18.4
Of Those Achieving an Associate Degree ---							
Percent who also took Chem 121	44.4	30.8	40.0	29.4	38.9	31.6	35.2
Percent who never took another Chem course	55.5	69.2	33.3	52.9	44.4	36.8	47.3
Average hours of other Science courses taken	6.9	8.5	7.5	7.1	8.4	8.0	7.8
Major Field Distribution							N PCT.
Liberal Arts	5	3	1	4	2	7	22 24.1
Science and Math	0	3	5	3	5	5	21 23.1
Business	2	2	4	3	2	4	17 18.7
Engineering	1	1	1	4	4	2	13 14.3
Health Career Programs	0	0	2	2	2	1	7 7.7
Data Processing	0	2	0	0	1	0	3 3.3
Education	0	0	1	1	0	0	2 2.2
Electronics	1	0	0	0	0	0	1 1.1
Fashion Design	0	1	0	0	0	0	1 1.1
Legal Tech	0	1	0	0	0	0	1 1.1
Food Service	0	0	1	0	0	0	1 1.1
Social Science	0	0	0	0	1	0	1 1.1
Music	0	0	0	0	1	0	1 1.1

Other Harper Chemistry Courses (besides Chemistry 110) Taken by Associate Degree Graduates who Enrolled in Chemistry 110

Course	Number of Graduates Who Took Course
Chemistry 121	113
Chemistry 122	16
Chemistry 131	11
Chemistry 100 (taken before Chem 110)	8
Chemistry 132	7
Chemistry 201	3
Chemistry 204	2
Chemistry 205	1

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OTHER SCIENCE COURSES (BESIDES CHEMISTRY) TAKEN BY ASSOCIATE DEGREE GRADUATES WHO ENROLLED IN CHEMISTRY 110

Course	Number of Graduates Who Took Course
Biology 110	25
Biology 160	18
Biology 140	16
Biology 103	14
Biology 130	14
Biology 161	13
Physics 201	13
Physics 202	11
Astronomy 101	11
Biology 101	10
Biology 120	9
Geology 101	7
Physics 203	5
Astronomy 111	5
Geology 102	3
Biology 122	3
Physical Science 101	3
Biology 136	2
Physics 121	2
Physics 122	1
Physics 101	1
Physics 102	1
Geology 201	1
Physical Science 105	1

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APPENDIX

SURVEY OF ILLINOIS COLLEGES AND UNIVERSITIES

Regarding General Chemistry Courses

Primarily for Chemistry and Chemical Engineering Majors

Description of Course

CHM-131 College Chemistry I (3-6)-- Studies principles of chemistry including molecular, atomic, nuclear and electronic theories of matter and their relations to the periodic table. Quantitatively treats oxidation reduction, chemical thermodynamics, bonding, behavior of gases, kinetics, equilibrium and solutions. Emphasizes interpretation of laboratory data. Primarily for students in chemistry, chemical engineering or physical sciences.

Prerequisite: Two semesters of high school chemistry with at least a "B" average, or at least a "B" in CHM -10. MTH 103 or concurrent enrollment.

CHM-132 College Chemistry II(3-6)-- Continues CHM-131. Primarily for students in chemistry, chemical engineering or physical science curricula. Laboratory includes qualitative analysis.

Prerequisite: CHM-131.

At Harper -- Two courses, 10 Credit Hours

1- What textbook(s) do you use for the course(s)?

_____

_____

_____

_____

2- How many courses and credit hours do you allocate for this purpose? _____

_____

3- What has been your pattern of enrollment in this course(s) over the last ten years? Check (✓) one.

_____ A. Increase in enrollments

_____ B. Stable enrollments

_____ C. Decline in enrollments

Do you have any explanation for increases or declines in enrollment over the years?

_____

_____

_____

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4- What is your average class size in this course(s)

_____ Lecture

_____ Lab

5- Who teaches the labs for this course(s)? Check (✓) one

_____ A. Primarily lab assistants

_____ B. Primarily full-time faculty

_____ C. Primarily part-time faculty

_____ D. Other staff (specify) _____

_____

6- What percent of the sections are taught by part-time faculty? _____

7- What percent of the sections are taught in the evening? _____

8- How do the day and evening sections differ with regard to class size, student type, pace, etc.? _____

_____

_____

_____

9- What is the average attrition rate or percent of withdrawals in this course(s)?

_____

10- What format do you use in this course(s)? Check (✓) all that apply.

_____ A. Traditional lecture

_____ B. Self-Paced-Learning

_____ C. Audio/Visual

_____ D. Telecourse

_____ E. Other (specify) _____

_____

For 4-year Colleges and Universities only

11- What is the trend in the number of Chemistry or Chemical Engineering majors at your college or university?

_____ A. They have increased

_____ B. They have been stable

_____ C. They have declined

Do you have any explanation for increases or decreases? _____

_____

_____

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THANK YOU for your cooperation. We will be glad to send you a copy of the completed analysis if you desire.

Desire copy of final analysis -- ☐

Please send to: _____

_____

_____

_____

ERIC Clearinghouse for Junior Colleges
8118 Math-Sciences Building
University of California
Los Angeles, California 90024

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